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Situated cognition in implementation: What teacher professional development looks like from a socio-psychological perspective

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Situated cognition in implementation: What teacher professional development looks like from a socio-psychological perspective

by

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Abstract

Situated cognition in implementation: What teacher professional development looks like from a socio-psychological perspective

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Much has been documented regarding the characteristics of effective professional development, but there is a conspicuous lack of research that attends to the ways that situational factors influence its implementation. Identifying and interpreting these factors can have important implications for designers and evaluators of professional development programs, especially if we are to understand knowledge construction as being culturally mediated, agentic, and situated within local contexts. This study seeks to uncover the social and psychological factors that mediate the way local actors implement professional development by analyzing how facilitators and teachers enact a large-scale professional development program in the absence of strict fidelity expectations.

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Chapter 1

Introduction

Professional development for in-service teachers is common practice in the United States, but initiatives designed to improve instructional practice can be difficult to evaluate. Understanding what makes professional development effective is critical to making productive use of teachers' and professional developers' time and effort. This process of evaluating and defining effective professional development is vital to the well being of American education because professional development is often the means by which state and local leaders attempt to implement reforms and improve classroom practice. Major decisions about what teachers are taught, and when, where and how they are trained hinge on current understandings of what constitutes effective professional development.

Many studies have been conducted that describe what effective professional development looks like, but there is a conspicuous lack of research that attends to the ways that situational factors influence the implementation of professional development. These factors can influence both the facilitators who conduct the trainings and teachers who participate and then enact what they have newly learned in their classrooms. More research needs to be done that focuses on understanding the ways that facilitators and teachers notice, frame, interpret, and construct meaning from the constructs, concepts and instructional practices that are discussed in professional development settings (Spillane, Reiser, & Reimer, 2002).

In the sections that follow, I review the research on the effectiveness of professional development, focusing most heavily on the extant research that has attempted to describe the characteristics of professional development that make it effective. Then, drawing from Spillane, Reiser, and Reimer's (2002) framework for policy implementation, I argue for the value of taking a socio-psychological approach if we want to bridge the gap between research and practice in terms of effective professional development for teachers. I end this report by proposing a study that aims to elucidate many of the nuances that are associated with whether and how teachers implement what they have learned in professional development. My hope is that such a study could help make Spillane et al.'s framework more meaningful and accessible to researchers and practitioners of teacher professional development.

Chapter 2

Literature Review

What Makes Professional Development Effective?

Research has documented multiple ways that in-service training can support teachers' development. Professional development has been shown to increase teacher content and pedagogical knowledge (Goldschmidt & Phelps, 2010; Kanter & Konstantopoulos, 2010; Supovitz, Mayers, & Kahle, 2000), change teachers' instructional practice (Buczynski & Hansen, 2010; Desimone, Porter, Garet, Yoon, & Birman, 2002; Foley, Khoshaim, Alsaeed, & Nihan Er, 2012; Van Duzor, 2010), and improve student achievement (Desimone, Smith, & Phillips, 2013; Yoon, Duncan, Lee, Scarloss, & Shapley, 2007). Yoon et al. (2007) reviewed more than 1,300 studies that potentially addressed the effect of professional development on student achievement. Of the total number of studies, only nine met the What Works Clearinghouse evidence standards for rigorous research. Of the 20 identified effects from these nine studies, all but two of them were positive. One important conclusion from this study is that more time spent in professional development seemed to have a stronger effect on student achieve. Averaging across the nine studies showed that teachers who receive about 49 hours of professional development can boost their students' achievement scores by 21 percentile points.

In order to describe what makes professional development effective, research has produced lists of features found to be characteristic of effective professional development (Cormas & Barufaldi, 2011; Guskey, 1997). Garet, Porter, Desimone, Birman, and Yoon

(2001) surveyed a nationally representative sample of teachers to gather information about the type of professional development in which the teachers participated as well as the teachers' reports of their own increase in knowledge and skill and changes in classroom practice. The results identified six features of professional development that were associated with enhanced knowledge, skill, and practice of teachers. Specifically, they concluded that effective professional development usually is not enacted in a traditional "workshop" setting and typically has a longer duration, actively engages teachers in the learning process, is focused on content, is coherent with what the teacher is already doing in the classroom, and involves the collective participation of teachers from the same school, department, or grade level. Reporting on the longitudinal effects of that study, Desimone et al. (2002) found all characteristics, with the exception of *duration*, to have positive effects on teacher instruction.

Some studies have validated the effectiveness of one or more of these characteristics, while others have identified similar characteristics of professional development that seem to be effective for supporting positive change in instructional practice. For example, Van Duzor (2010) explained why teachers playing an active role in professional development would have such an impact on classroom practice:

> Emphasizing pedagogical contexts that explicitly incorporate teachers' experience within professional development can support teachers as active, reflective practitioners in the process of transfer to the classroom. The rich integration of teacher professional knowledge with teacher learning within the professional development classroom highlights the active role teachers take in appropriating concepts and activities from the professional development classroom for their own classrooms. This is of particular importance in an educational era of accountability that too often casts professional development as teacher training rather than teacher learning. (p. 372)

In support of the notion of collective participation, Foley et al. (2012) found that one of the main factors contributing to math teachers' implementation of the desired change in instructional practice (i.e., having their students engage in cognitively demanding tasks) was that they stayed in communication with other math teachers. Foley et al. (2012) also pointed to the importance of content-focused professional development by showing that teachers were more likely to implement the targeted instructional practice in their classrooms when they felt confident in their ability to teach that specific content area. Desimone et al. (2013) explained the reasoning behind this by stating that "the main hypothesis supporting a relationship between content focused professional development and teacher learning and change is that to teach conceptually, teachers must first build their own knowledge of a subject and of how students learn that subject" (p. 11-12).

Another characteristic of professional development that has been studied is the way in which in-service training is differentiated according to the needs of teachers. Krull, Oras, and Sisask (2007) used a grounded theory approach to analyze the comments made by experienced and novice teachers viewing videotapes of their own lesson activities. They found that experienced teachers were more sensitive than novice teachers towards the features of classroom instruction that were relevant to the professional development. They suggest that professional development that helps increase novice teachers' sensitivity to those relevant features may aid in transfer of professional development to teaching practice in the classroom.

In another study that also looked at differences in the experience levels of teachers, Antoniou and Kyriakides (2013) presented a framework for designing

professional development that is differentiated according teachers' developmental level. They contrasted their Dynamic Integrated Approach (DIA) with the Holistic Approach, which they characterized as professional development practice that involves having all teachers reflect broadly on their teaching practice to consider ways to improve. They argued that it is important to train teachers according to their specific need as determined by their stage of development and not just through general reflection on teaching practices. Their study compared the impact of each approach on teaching quality through direct observation of instruction. Each teacher was scored using two low and one high inference observation instruments by raters who were blind to each teacher's previously determined developmental stage. The DIA was found to have a significant impact over the Holistic Approach on improving teaching skills.

Another characteristic of professional development important for changing instructional practice is that it should be relevant to the specific concerns of the teacher. Van Duzor (2012) noted three aspects of science professional development likely to motivate teachers to transfer professional development experiences into their own practice: 1) that the professional development helps teachers recognize how concepts can be used to address learning needs specific to their students; 2) that teachers feel free to adapt the professional development to their own needs and in their own way; and 3) that as part of the professional development teachers learn how to teach "process skills" (i.e., skills associated with the process of scientific investigation), an important aspect of science curriculum and major concern of science teachers.

Related to relevance is the idea that professional development should be specific. Desimone et al. (2002) noted that "professional development focused on specific teaching practices increases teachers' use of those practices in the classroom" (p. 102). Leung (2012) elaborated on this by arguing that teachers often view PD programs as overly theoretical and not applicable to their particular teaching context. She stated that it is important for professional developers to make PD more practical by specifically showing teachers how tasks can be enacted in the classroom.

In a review of ten years of research in professional development, Avalos (2011) summarized the ways in which professional development practice has evolved to be a more effective catalyst for change in the classroom. First, professional development has moved away from the traditional in-service teacher training (INSET) model to one that is more collaborative, ongoing, and situated in teachers' experiences. What began as a top-down approach where teachers learned from teacher educators functioning in a "master" role is now more of a partnership. Second, previous one-shot workshop type professional development programs are fading away and being replaced by prolonged interventions. Understanding teacher change to be a process that occurs over time, professional developers are now making greater efforts to provide continual support to educators. Third, we are now finding more effective ways to have teachers reflect on their own practice and consider ways to improve. Technology is used in various ways, from facilitating online discussions to providing teachers with the opportunity to view video of their own lessons taught. There is also more of an emphasis on co-learning for reflective

purposes, such as lesson studies, coaching, action research and other activities that are designed to have teachers work together to improve their own practice.

Understanding Professional Development from a Socio-Psychological Perspective

The studies presented in the previous section have done well to describe the type of professional development likely to have the most positive impact on instructional practice. However, in order to design and carry out professional development programs based on these characteristics, it is important to attend to the situational characteristics of both individual teachers and the school system in which they operate. This idea is not new. Researchers and professional development designers have long been aware of the need to consider these contextual factors (Loucks-Horsley, Stiles, Mundry, Love, & Hewson, 2010). However, most of what is known about the contextual influences of professional development has been concerned with factors that are somewhat more external to the individual such as local and state learning standards, organizational culture, available resources, rather than with factors that are more psychological or internal to the individual. Yet, understanding these psychological factors is important, especially if we are to view facilitators and teachers as agentic sense-makers who will construct different meanings from any one professional development program.

Spillane et al. (2002) presented what they termed a *cognitive framework* for understanding policy implementation in educational settings. Although they applied their framework more broadly (i.e., any national, state or local educational reform), much, if not most, professional development falls under the umbrella of reform to some degree, and is often implemented (or even mandated) at the school, district, or even the state

level. The utility of Spillane et al.'s framework for understanding teacher professional development is that it brings the individual teacher to the forefront of analysis, making it possible it to evaluate a professional development program not only in terms of its total or average effect across a representative sample of teachers, but also in terms of its adaptability to personal and situational needs. This additional lens is valuable because it would be naïve to assume that professional development programs can be implemented in a purely uniform manner or that such uniformity is always desirable. Spillane and colleagues put it this way (note: for purposes here, *policy* may stand for *professional development*):

> Policy messages are not inert, static ideas that are transmitted unaltered into local actors' minds to be accepted, rejected, or modified to fit local needs and conditions. Rather, the agents must first notice, then frame, interpret, and construct meaning for policy messages. Conceptualizing the problem of implementation in this way focuses attention on how implementing agents construct the meaning of a policy message and their own behavior, and how this process leads or does not lead to a change in how they view their own practice, potentially leading to changes in both understanding and behavior. (p. 392)

To understand implementation from this perspective, Spillane and colleagues (2002) outlined three core aspects of their framework: individual cognition, situated cognition, and the role of representations. *Individual cognition* concerns the ways that participants notice and interpret information, and it is influenced by their own prior knowledge, beliefs, and experiences. *Situated cognition* underscores not only how contextual factors influence a person's knowledge construction, but also how they play a functional role in individuals' sense-making processes. *Role of representations* concerns the content itself and how that content is represented among participants. This includes the ways the content is represented in spoken word, in visual forms, or within an

individual's own mind. The key point here is that what and how content is represented affects the way and extent to which individuals can make sense of message being taught.

While aspects of Spillane et al.'s framework have been used in many studies investigating teacher learning and instructional practice in the context of educational reform (Coburn, 2006; Geijsel, Sleegers, Stoel, & Kruger, 2009; Murchan, Loxley, & Johnston, 2009; Schmidt & Datnow, 2005; Wallace & Priestley, 2011), I found no studies to date that use their framework to examine teacher learning and instructional practice when the professional development was *not* a matter of policy implementation. This signals a gap in research as many professional learning programs for teachers are designed to support teacher development without requiring changes in policy. Due to the utility of Spillane et al.'s framework, as evidenced by supporting research, this proposal seeks to expand its use by applying it to professional development that is enacted in the absence of strict fidelity expectations.

Chapter 3

The Proposed Study

In order to incorporate such a framework into the ways we study and implement effective professional development practices, we need first to identify and explore the situational factors that are both internal and external to the individual. The study proposed here seeks to shed light on this process by examining the ways that one professional development for mathematics teachers is iterated across various regions of Texas and then how that professional development is enacted across various schools and districts in each region as it is implemented in the classroom. By examining a single professional development program that is subsequently iterated across a variety of contexts, I hope to be able to describe the professional development in its "original" presentation and track its evolution across levels of implementation as it is taken up by different participants both within and across a variety of locations. My goal is to contribute to a better understanding of how professional development facilitators and teachers notice, frame, interpret, and construct meaning for in-service mathematics trainings and to identify the external factors that mediate the process by which professional development makes its way into the classroom. There are four main research questions addressed by this study: 1) What are the changes and adaptations made each time the professional development is presented? 2) What reasons do participants give for making those changes? 3) What other contextual factors may be influencing professional development implementation? 4) What effect do these changes have on the way that teachers intend to implement the professional development in their classrooms?

To investigate these questions, this study will track a professional development program, entitled *Focus on Algebra: Quadratic Functions*, as it is implemented across a statewide collaborative model of professional development enacted by the Texas Regional Collaboratives for Excellence in Science and Mathematics Teaching (TRC).

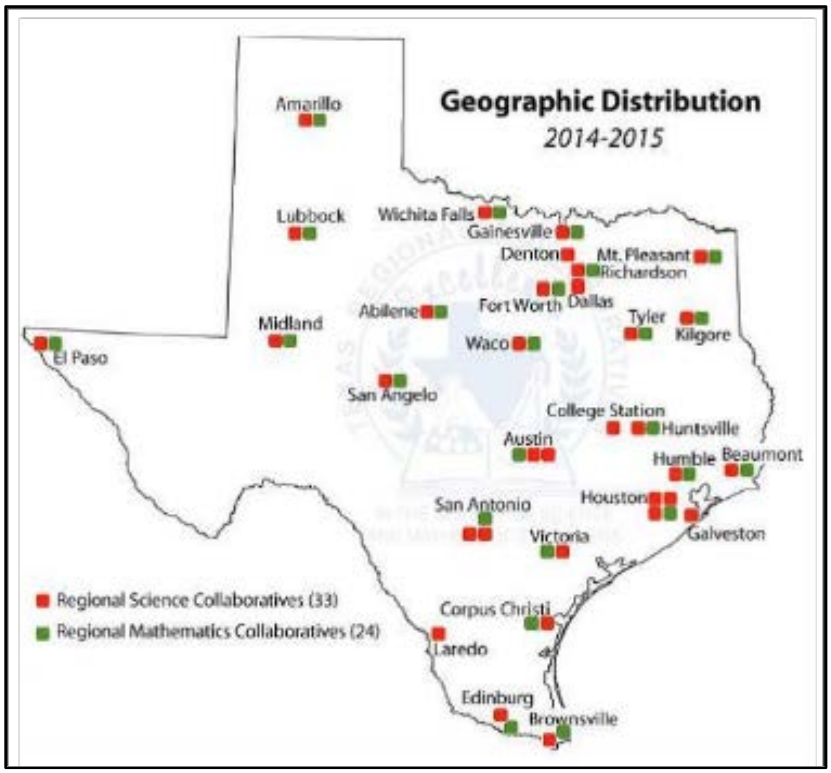

Figure 1. Map showing the geographic distribution of collaboratives across Texas. Obtained from http://www.thetrc.org/about-the-trc/

The TRC is an organization that facilitates professional development for math and science teachers in Texas by offering grants to educational institutions to provide professional development training for teachers (e.g., educational service centers, school districts, schools, and university-affiliated in-service training programs). If awarded a

grant, organizations are required to create a collaborative of math or science teachers (or both) to facilitate professional development for teachers. The TRC has 24 mathematics collaboratives, of which the majority are run by educational service centers, and a few are led by university-affiliated organizations or school districts (see Figure 1). Each collaborative is required to enlist a number of math teacher mentors. Each math teacher mentor is required to participate in 100 hours of professional development over the course of the year, and also mentor other teachers (called *cadre members*) in their school or district.

Participants

Participants for this study will include those individuals who provide the trainings (*facilitators*) and the teachers who participate in the sessions (*teachers*). There will be approximately 30 facilitators and 200 teachers in the study. The teachers may have a role in the collaborative as a teacher mentor or cadre member, or they may participate in the training without being an official member of the collaborative. Regardless of their role in the collaborative, all teacher participants will be regular classroom math teachers who teach Algebra at either the Middle School or High School level.

The Collaboratives

Each year, professional development facilitators from each of the 24 mathematics collaboratives are brought in to one central location to attend the Professional Development Academy (PDA). During the PDA, facilitators participate in professional development training that they can then provide to the teachers in their collaborative. The PDAs are usually held each May, allowing facilitators to return to their respective

collaboratives and offer professional development sessions in the summer or during the following school year, as they so choose. The professional development trainings that are offered in each collaborative are open to all math teachers, whether they are a math teacher mentor, cadre member, or a math teacher who does not have an official role in the TRC collaborative model. In addition to implementing in their own classrooms what they have learned, math teacher mentors may also train cadre members at their school or district. However, the mentoring/training that math teacher mentors provide for their cadre members does not have to come from the professional development that was provided by their collaborative. Figure 2 provides a visual description of how this flow of professional development trainings takes place.

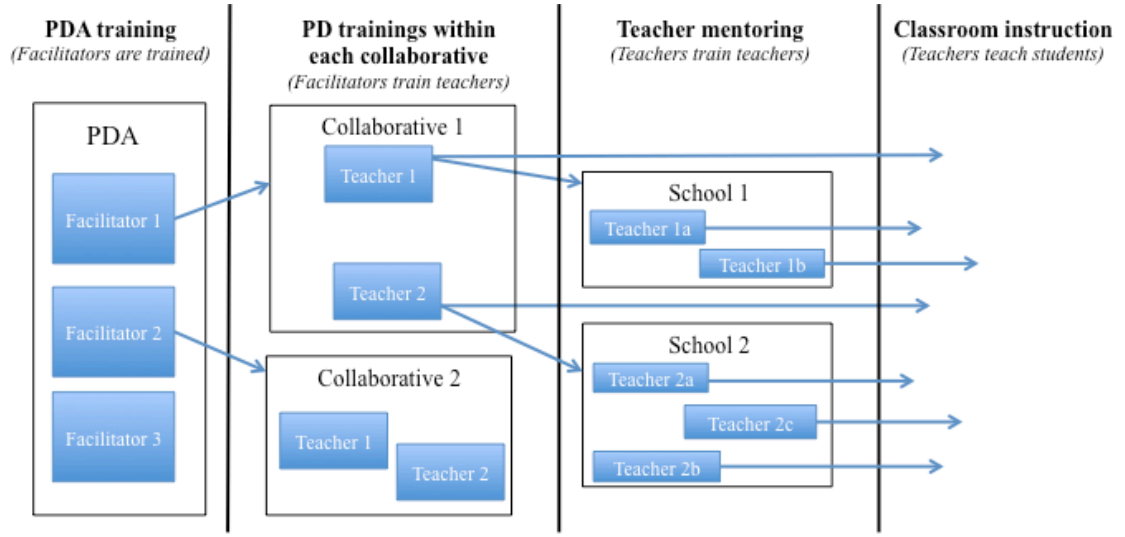

Figure 2. A diagram showing the flow of professional development training as it is iterated across multiple levels and then finally implemented in the classroom.

Chapter 4

Methods

Procedures

The operational goal of this study is to document the evolution of one math teacher training across multiple iterations and across multiple settings and regions. This evolution will be measured by tracking the elements of the original training in order to identify patterns in the ways that facilitators and teachers notice, frame, interpret, and construct meaning from the professional development they experience. To do this, participants will be surveyed before and after each level of training through online questionnaires. The surveys that facilitators and teachers will complete are designed to mirror one another in order to provide meaningful comparisons both within and across individuals. In addition to the survey data, select participants will be observed and interviewed in order to provide a more in-depth analysis of the mediating factors that influence professional development implementation.

Measures

Data will be collected through online surveys, field notes taken during observations, and semi-structured interviews conducted with facilitators and teachers. Figure 3 below provides a visual representation of when the data from the different measures will be collected.

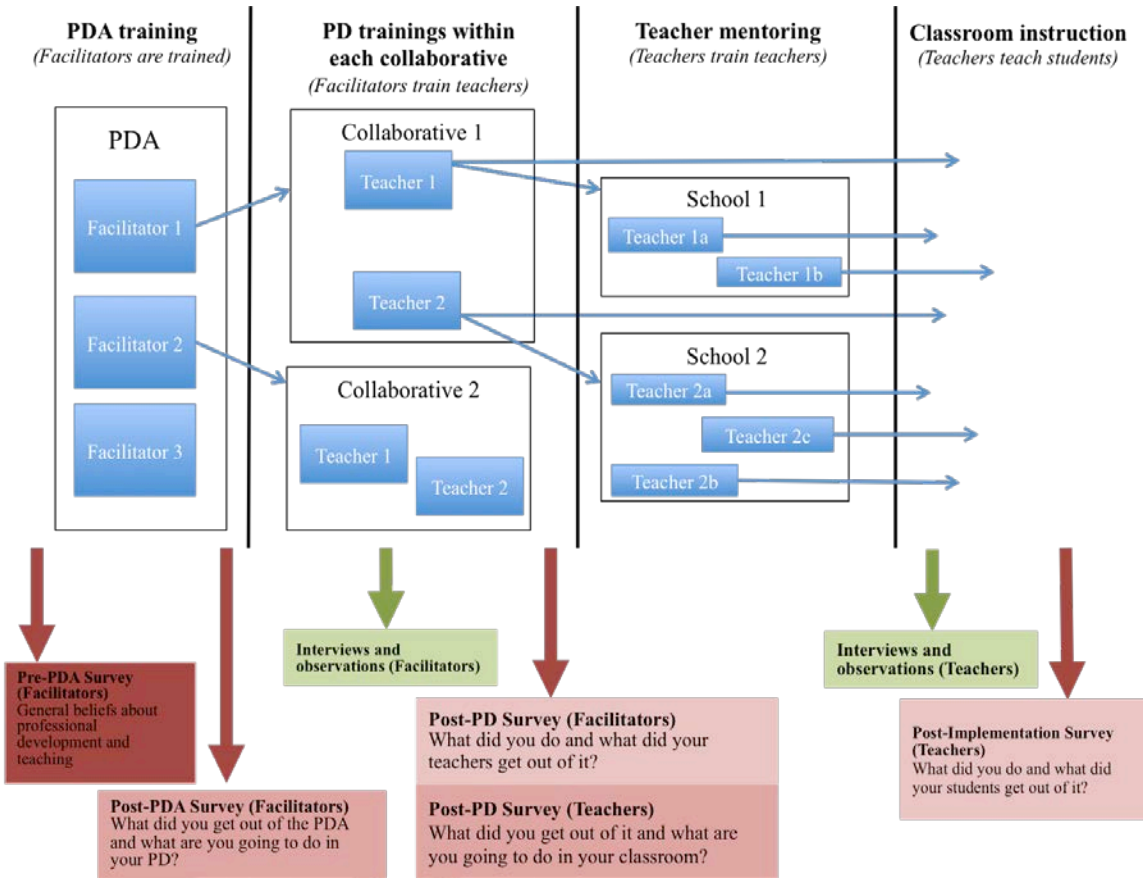

Figure 3. A diagram showing the time points (relative to the professional development trainings and classroom teaching) at which the various measures take place.

Surveys. Five surveys will be administered to participants, three to be completed by facilitators and two to be completed by teachers. Prior to the original training (the PDA), facilitators will be given the *Pre-PDA Survey*, designed to assess their general beliefs and attitudes about teaching. This survey is a combination of two existing surveys regarding 1) teacher beliefs about non-traditional math instruction (adapted from Wooley, Benjamin, & Wooley, 2004) and 2) attitudes about professional development and teaching (adapted from Beard, Hoy, & Woolfolk-Hoy, 2010). The purpose of these surveys is to help control for individual differences that exist prior to the training and that

may or may not persist throughout subsequent enactments of training.

After participating in the PDA, facilitators will complete the *Post-PDA Survey* regarding their perceptions of the training and their intentions for implementing it in their own collaboratives. This survey consists of open ended questions that ask respondents to give a brief description of the training in their own words, identify which aspect(s) of the training they thought the PDA administrators wanted them to learn, identify the aspect(s) they found to be of most value, and to describe their main "takeaways" in terms the instructional practices and math content they intend to teach the teachers in their own collaboratives. The survey also lists the main topics covered and activities conducted in the training and asks respondents to rate how likely they are to cover that topic or include that activity when they turn the training around in their own collaboratives.

After they implement the training in their own collaboratives, facilitators will complete the *Post-PD Survey for Facilitators*. This survey mirrors the Post-PDA Survey in that it asks them to provide a brief description of their training, as well as to identify what was taught in terms of instructional strategies and math content. Also, like the Post-PDA Survey, it provides a list of the major topics and activities presented in the PDA and asks them to specify whether they covered/used that item as is, with major modifications, with minor modifications, or not at all.

At the same time facilitators receive the Post-PD Survey for Facilitators, the teachers who participate in the training receive the *Post-PD Survey for Teachers*. This survey is much like the survey that facilitators received after participating in the PDA: teachers are asked to provide a brief description of the main points or principles taught in

the training and to identify which aspects of the training they found to be most valuable. Teachers are also asked to explain what they intend to do differently in their classrooms as a result of the training. Finally, after teachers implement the training in their own classroom, they will complete the *Post-Teaching Survey* regarding what aspects of the training actually was presented in their own classroom.

Observations. Field notes will be taken during the PDA and during select professional development training sessions conducted within the collaboratives. The purpose of these observations is to document the topics and activities that were covered in the training, as well as other observations that may be relevant to the way the training is given or received. Observations will also be conducted in select classrooms in order to document the topics and activities that teachers introduce to their students, as well as other observations that may be relevant to the way the professional development training received by the teacher is applied in practice.

Interviews. Semi-structured interviews, conducted with volunteers from among the facilitators and teachers who were selected for observations, will occur after the facilitator or teacher has completed the training session or classroom instruction, respectively. Questions will be designed to elicit explanations for why they chose to do things the way they did.

Chapter 5

Analysis Plan

This project will analyze data collected from members of the Texas Regional Collaboratives for Excellence in Math and Science Teaching (TRC) and teacher participants involved in mathematics professional development (PD). The Pre-PDA Survey will be used as a means of determining whether there are any major differences among facilitators in terms of their general beliefs about teaching. If differences do exist, these may be used to form comparison groups for the analysis of the other four surveys.

Each of the other four surveys (Post-PDA Survey for Facilitators, Post-PD Survey for Facilitators, Post-PD Survey for Teachers, and Post-Teaching Survey for Teachers) is structured the same way so as to allow for comparisons to be made across all four. Table 1 provides a side-by-side comparison of these four surveys showing how questions are related.

Table 1. Side-by-side comparison of the surveys for facilitators and teachers.

Category	General Description	Post-PDA Survey for Facilitators	Post-PD Survey for Facilitators	Post-PD Survey for Teachers	Post-Teaching Survey for Teachers
Main ideas, Take-aways	Summary of the PD	Please describe in your own words what this professional development was about.	Reflect back on the FOA: Quadratic Functions PD that you provided in your collaborative. Please provide a statement of what your training was about	In your own words, please summarize what you feel were the main points or principles that were taught in this training	
	Most salient, valuable	What aspects of this professional development were most important to you and why?	What was the most important idea or ideas you hoped to communicate during the training?	What aspects of this professional development were most valuable to you and why?	
	Math content	When you implement the Focus on Algebra Part II: Quadratic Functions PD, what mathematical concepts or ideas do you want your teachers to learn?	What new mathematical concepts or ideas did your teachers learn as a result of participating in your collaborative's PD?	As a result of this training, what are you going to do differently when you teach quadratic functions to your students?	When teaching your students about quadratic functions, what did you do differently as a result of having participated in the Focus on Algebra: Quadratic Functions professional development training?
	Instructional strategies	When you implement the Focus on Algebra Part II: Quadratic Functions PD, what instructional practices do you want your teachers to learn?	What new instructional practices or strategies did your teachers learn as a result of participating in your collaborative's PD?		
Overall intention to implement	Percentage of content	What percentage of the content and activities of this training do you think you will use in the trainings that you do in your own collaborative?	In your estimation, what percentage of the content and activities of the original PDA training did you use in your collaborative's PD?	What percentage of this training do you think you will use with your students in your classroom?	Thinking back on the whole of the Focus on Algebra: Quadratic Functions training, what percentage of that training did you end up using with your students this year?
	Percentage of structural features	What percentage of the structure and format (i.e., the sequence, the way topics were introduced, the roles of both the facilitators and the participants, etc.) do you think you will keep the same in the trainings that you do in your own collaborative?	In your estimation, what percentage of the structure and format (i.e., the sequence, the way topics were introduced, the roles of both the facilitators and the participants, etc.) did you keep the same in your collaborative's PD?		
	Reasons for excluding content	For question A (content and activities) above, please explain your reasons for excluding anything.	For question A (content and activities) above, please explain your reasons for excluding anything.	Please explain your reasons for excluding anything.	Please explain your reasons for excluding anything.
	Reasons for excluding structural features	For question B (structure and format) above, please explain your reasons for excluding anything.	For question B (structure and format) above, please explain your reasons for excluding anything.		

Table 1, cont.

Specific intention to implement	List of activities done in original PDA	How likely are you to use these activities? 5 pt scale: Not at all likely/Slightly likely/Moderately likely/Very likely/Extremely likely	Please indicate how you used or did not use each activity. 4 pt scale: Did not use at all/Used with major modifications/Used with minor modifications/Used with no modifications	Was this activitie included? 3 pt scale: Yes, No, Not sure Do you plan to use it with your students? 2 pt scale: Yes, No	Did you use this activity with your students?
	Reasons for including or excluding activities	Please use the space below if you wish to clarify/explain any of your responses above. (Optional)	Please explain reasons for omitting or modifying any of the above activities:		
	List of topics covered in original PDA	How likely are you to cover these topics in your own training? 5 pt scale: Not at all likely/Slightly likely/Moderately likely/Very likely/Extremely likely	Please indicate how you addressed or did not address each topics. 4 pt scale: Did not address at all/Briefly addressed/Thoroughly addressed, but with modifications/Thoroughly addressed	Was this topic included? 3 pt scale: Yes, No, Not sure Do you plan to incorporate it with your students? 2 pt scale: Yes, No	Did you incoporate aspects of this topic when you taught your students?
	Reasons for including or excluding topics	Please use the space below if you wish to clarify/explain any of your responses above. (Optional)	Please use the space below to explain your reasons for omitting or modifying any of the above topics.		
	Additional activities	What activities (if any) are you planning to add to the training you conduct in your collaborative?	Did you add activities or cover additional topics in your training that were not a part of the original PDA training or materials? If yes, please explain.		
Constraints and other	Days dedicated to PD	How many days of professional development will your Collaborative likely dedicate to this training?	How many total days did you present this PD?		
	Constraints	Please explain any constraints that may influence how and what is implemented when you provide this training in your collaborative.	Please explain any constraints that influenced how you implemented this training in your collaborative.	Please explain any constraints that may influence how and what from this training you decide to use with your students.	Please explain any constraints that influenced how and what from this training you ended up using with your students.
	Other	Finally, if there is anything else you can tell us about your perceptions of or takeaways from the PDA that was not covered in this survey, please write it below.	Is there anything else that you would like to tell us about the PD you implemented?	If there is anything else that you would like to share, please write it here:	Is there anything else that you would like to share about your experience implementing this training in your classroom?

The first four rows of items in the table above consist of the open-ended questions facilitators and teachers were asked on each survey. Participants' responses to these questions will be coded qualitatively in two ways. First, they will be assigned codes that represent the various elements featured in the original PDA. The purpose of this coding is to track those aspects of the professional development that participants noticed the most and map the ways that these aspects are or are not "passed along" to those they train or teach. A second wave of coding will then be done to identify emergent themes within and across collaboratives. The purpose of this coding to aid in interpreting the results of the first wave of coding by identifying and categorizing how participants framed, interpreted, and made sense of the training they received as well as the training or teaching the planned to implement.

The remaining sections of the above table provide additional ways of tracking the uptake and implementation of the content of the professional development both quantitatively and qualitatively. The Post-PDA Survey for Facilitators will provide the percentage of the overall content and structure from the original PDA that each facilitator intends to use in the training done in his/her own collaborative. It will also provide an item-by-item rating of the extent to which specific activities and topics are intended to be implemented and then actually implemented by the facilitators in their own trainings. The means and standard deviations for these data will be calculated and an overall estimation will be obtained of the percentage of the PDA that remained as facilitators thought about implementing professional development trainings in their own collaboratives. Similar

calculations will be done for the data from the Post-PD Survey for Facilitators and the Post-PD Survey for Teachers. These measures will be compared within participants to examine the extent to which intent to implement differed from actual implementation, and between participants to look at differences in the way facilitators and teachers intended and actually implemented the professional development.

Survey results will also be used to conduct a conditional probability analysis in order to examine the percentage of the original PDA that facilitators implemented in their own collaboratives, and the percentage of the original PDA that teachers said they intended to incorporate in their own instructional practice. Results will be used to describe how facilitators and teachers mediated the implementation of training content.

After the survey results are compiled and analyzed, data from the observations and interviews will be used to enhance and explain the results. The fine-grained analysis that these observations and interviews will provide can aid in explicating the roles that situated factors played in mediating the way facilitators and teachers constructed knowledge and they way that they implemented what they learned at subsequent stages of this process.

Chapter 6

Limitations

One potential limitation of this study stems from the reliance of surveys to track changes made at each iteration of the professional development. Survey responses may suffer from social desirability bias participants answer questions in a way that they believe will create the impression of fidelity to the original training. To address this issue, facilitators are reassured both in the emails containing the survey link and in the surveys themselves that the surveys are a part of an independent research study and are not in anyway an evaluation of their professional development program. Additionally, the design of the study allows for comparisons between linked facilitator/trainee pairs. Both facilitators and teachers are asked independently to report on the content of the professional development sessions. Thus, teacher reports can be used a check for accuracy of facilitators' responses.

Another limitation may be that although the surveys are comprehensive in the sense that they cover all materials provided and major topics covered in the original PD, the depth of information regarding a particular professional development training that can be captured by a survey may be relatively shallow when compared to what could be understood by means of systematic observations and interviews with facilitators and attendees. However, the purposes of the proposed study are centered on the more salient aspects of professional development to which participants are attending. Additionally,

because much of the information to be gathered concerns participants' own perceptions, intentions, and rationale, self-report measures may be ideally suited for this type of data. Lastly, the use of an online survey may also aid in the timeliness of data collection as participants are dispersed over a wide geographic area and each collaborative's training is occurring at different times of the year.

Finally, although this study includes a decently sized sample from a variable range of locations, it may be that the results do not capture the full range of mediating factors that influence the way professional development is interpreted and enacted. The main limitation of the study's generalizability concerns the fact that only one type of professional development is being studied. In another way, however, this limitation is a strength of the study in that it allows for clearer comparisons to be made across the entire sample of participants. Nonetheless, collective understanding and application of these results would benefit from additional studies that would investigate these situated factors in different types professional development.

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